CLAIMS:

1. An optical recording medium comprising a substrate, at least one recording layer provided on the substrate and at least one dielectric layer provided adjacent to the at least one recording layer, the optical recording medium being constituted so that when it is irradiated with a laser beam having a wavelength λ via an objective lens having a numerical aperture NA satisfying $\lambda / NA \leq 640$ nm from the side opposite from the substrate, a record mark whose reflection coefficient is different from those of other regions of the at least one recording layer is formed in the at least one recording layer and at least a part of a region(s) of the at least one dielectric layer adjacent to the record mark is crystallized to form a crystallized region.

2. An optical recording medium in accordance with Claim 1, wherein the at least one recording layer is constituted by a first recording layer containing one element selected from the group consisting of Si, Ge, Sn, Mg, C, Al, Zn, In, Cu, Ti and Bi as a primary component and a second recording layer provided in the vicinity of the first recording layer and containing one element selected from the group consisting of Cu, Si, Al, Zn and Ag and different from the element contained in the first recording layer as a primary component and when the laser beam is projected, the element contained in the first recording layer as a primary component and the element contained in the second recording layer as a primary component are mixed with each other, thereby forming a record mark.

3. An optical recording medium in accordance with Claim 2, wherein the second recording layer is formed to be in contact with the first recording layer.

4. An optical recording medium in accordance with Claim 2, wherein a first dielectric layer is formed so as to be in contact with the first recording layer and a second dielectric layer is formed so as to be in contact with the second recording layer.

5. An optical recording medium in accordance with Claim 2, wherein the first recording layer contains an element selected from the group consisting of Si, Ge and Sn as a primary component.

6. An optical recording medium in accordance with Claim 4, wherein the first recording layer contains an element selected from the group consisting of Si, Ge and Sn as a primary component.

7. An optical recording medium in accordance with Claim 2, wherein the second recording layer is added with an element selected from the group consisting of Cu, Al, Zn, Ag, Mg, Sn, Au, Ti and Pd and different from the element contained in the first recording layer as a primary component.

8. An optical recording medium in accordance with Claim 4, wherein the second recording layer is added with an element selected from the group consisting of Cu, Al, Zn, Ag, Mg, Sn, Au, Ti and Pd and different from the element contained in the first recording layer as a primary component.

9. An optical recording medium in accordance with Claim 2, which further comprises a light transmission layer provided on a side opposite to

the substrate with respect to the first recording layer and the second recording layer.

10. An optical recording medium in accordance with Claim 4, which further comprises a light transmission layer provided on a side opposite to the substrate with respect to the first recording layer and the second recording layer.

11. A method for recording data in an optical recording medium comprising steps of irradiating an optical recording medium comprising a substrate, at least one recording layer provided on the substrate and at least one dielectric layer provided adjacent to at least one recording layer with a laser beam having a wavelength λ via an objective lens having a numerical aperture NA satisfying $\lambda / NA \leq 640$ nm from the side opposite from the substrate, forming a record mark in the at least one recording layer and crystallizing at least a part of a region(s) of the at least one dielectric layer adjacent to the record mark, thereby forming a crystallized region in the at least one dielectric layer.

12. A method for optically recording data in accordance with Claim 11, which comprises steps of projecting the laser beam onto the optical recording medium in which the at least one recording layer is constituted by a first recording layer containing one element selected from the group consisting of Si, Ge, Sn, Mg, C, Al, Zn, In, Cu, Ti and Bi as a primary component and a second recording layer provided in the vicinity of the first recording layer and containing one element selected from the group consisting of Cu, Si, Al, Zn and Ag and different from the element contained in the first recording layer as a primary component and mixing

the element contained in the first recording layer as a primary component and the element contained in the second recording layer as a primary component with each other, thereby forming a record mark.

13. A method for optically recording data in accordance with Claim 12, wherein the second recording layer of the optical recording medium is formed to be in contact with the first recording layer thereof.

14. A method for optically recording data in accordance with Claim 12, wherein the optical recording medium further comprises a first dielectric layer formed so as to be in contact with the first recording layer and a second dielectric layer formed so as to be in contact with the second recording layer.

15. A method for optically recording data in accordance with Claim 12, wherein the first recording layer contains an element selected from the group consisting of Si, Ge and Sn as a primary component.

16. A method for optically recording data in accordance with Claim 12, wherein the second recording layer is added with an element selected from the group consisting of Cu, Al, Zn, Ag, Mg, Sn, Au, Ti and Pd and different from the element contained in the first recording layer as a primary component.

17. A method for optically recording data in accordance with Claim 11, which further comprises a step of recording data in the optical recording medium by modulating power of the laser beam in accordance with a single pulse pattern when a recording linear velocity is equal to or higher

than a predetermined recording linear velocity.

18. A method for optically recording data in accordance with Claim 12, which further comprises a step of recording data in the optical recording medium by modulating power of the laser beam in accordance with a single pulse pattern when a recording linear velocity is equal to or higher than a predetermined recording linear velocity.

19. A method for optically recording data in accordance with Claim 13, which further comprises a step of recording data in the optical recording medium by modulating power of the laser beam in accordance with a single pulse pattern when a recording linear velocity is equal to or higher than a predetermined recording linear velocity.

20. A method for optically recording data in accordance with Claim 14, which further comprises a step of recording data in the optical recording medium by modulating power of the laser beam in accordance with a single pulse pattern when a recording linear velocity is equal to or higher than a predetermined recording linear velocity.